

10/774,619  
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**What is Claimed is:**

1. A chemical compound, comprising the general formula  $L\{YX_m\}_n$ ,  
wherein:

X is selected from the Group 13 elements consisting of boron,  
aluminum, gallium, indium, and tellurium;

5 Y is selected from the halide group consisting of fluorine,  
chlorine, bromine, iodine, and astatine;

L is a chelating ligand containing at least one binding atom  
contacting the Group 13 element, the atom being selected from the group  
consisting of C, N, O, and S; and

10 m and n are integers having a value of at least 1.

2. A chemical compound, comprising the general formula  $L\{YX_m\}_n$ ,  
wherein:

L is a Schiff base-containing ligand;

5 X is selected from the Group 13 elements consisting of boron,  
aluminum, gallium, indium, and tellurium;

Y is selected from the halide group consisting of fluorine,  
chlorine, bromine, iodine, and astatine; and

m and n are integers having a value of at least 1.

3. The chemical compound of claim 2, wherein L is a salen ligand.

4. The chemical compound of claim 2, wherein L is a bidentate ligand.
5. The chemical compound of claim 2, wherein L is a quadridentate ligand.
6. The chemical compound of claim 3, wherein L is selected from the group consisting of Salen (<sup>t</sup>Bu), Salpen (<sup>t</sup>Bu), Salben (<sup>t</sup>Bu), and Salhen (<sup>t</sup>Bu).
7. The chemical compound of claim 2, wherein Y is boron or aluminum.
8. The chemical compound of claim 2, wherein X is chlorine, bromine, or iodine.
9. The chemical compound of claim 2, wherein m and n are 2.
10. A method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with a compound comprising the general formula  $L\{YX_m\}_n$  wherein:
  - 5           L is a Schiff base-containing ligand;
  - X is selected from the group consisting of boron, aluminum, gallium, indium, and tellurium;
  - Y is selected from the halide group consisting of fluorine, chlorine, bromine, iodine, and astatine; and

**m and n are integers having a value of at least 1.**

- 11. The method of claim 10, wherein L is a salen ligand.**
- 12. The method of claim 10, wherein L is a bidentate ligand.**
- 13. The method of claim 10, wherein L is a quadridentate ligand.**
- 14. The method of claim 10, wherein L is selected from the group consisting of Salen (<sup>t</sup>Bu), Salpen (<sup>t</sup>Bu), Salben (<sup>t</sup>Bu), and Salhen (<sup>t</sup>Bu).**
- 15. The method of claim 10, wherein Y is boron or aluminum.**
- 16. The method of claim 10, wherein X is chlorine, bromine, or iodine.**
- 17. The method of claim 12, wherein m and n are 2.**
- 18. A catalytic method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with the compound of claim 2 in the presence of BBr<sub>3</sub>.**
- 19. The method of claim 18, wherein the phosphate ester or ether and BBr<sub>3</sub> are added in equimolar amounts.**

20. The method of claim 18, wherein the dealkylation is conducted at ambient temperature.

21. A catalytic method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with a compound comprising the general formula  $L\{YX_m\}_n$  wherein:

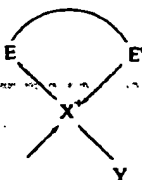
X is selected from the Group 13 elements consisting of boron, aluminum, gallium, indium, and tellurium;

Y is selected from the halide group consisting of fluorine, chlorine, bromine, iodine, and astatine;

L is a chelating ligand containing at least two molecules E and E' contacting the Group 13 element, the molecules E and E' being selected from the group consisting of C, N, O, and S; and

m and n are integers having a value of at least 1.

22. The method of claim 21, wherein the compound generates a cationic intermediate upon contacting the phosphate ester or ether, the cationic intermediate having the general formula:



23. The method of claim 21, wherein L is a Schiff base-containing ligand.

24. The method of claim 21, wherein L is a salen ligand.

25. The method of claim 24, wherein L is a bidentate ligand.

26. The method of claim 24, wherein L is a quadridentate ligand.

27. The method of claim 24, wherein L is selected from the group consisting of Salen (tBu), Salpen (tBu), Salben (tBu), and Salhen (tBu).

28. The method of claim 21, wherein Y is boron or aluminum.

29. The method of claim 21, wherein X is chlorine, bromine, or iodine.

30. The method of claim 21, wherein m and n are 2.

<sup>31</sup>  
~~32~~. The method of claim 21, wherein the reaction is conducted in the presence of BBr<sub>3</sub>.

<sup>32</sup> <sup>31</sup>  
~~33~~. The method of claim ~~32~~, wherein the phosphate ester or ether and BBr<sub>3</sub> are added in equimolar amounts.

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<sup>33</sup>  
34. The method of claim 21, wherein the dealkylation is conducted at ambient temperature.